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the reaction of blood; Extreme delicacy of the physiological regulation of the blood reaction; Regulation by the lungs, liver and kidneys; Effects of want of oxygen on the breathing; High balloon ascents, CO poisoning, and mountain sickness; Acclimatization to oxygen want:—the Anglo-American expedition to Pikes Peak in 1911; Acclimatization effects of oxygen want on the breathing; Acclimatization effects on the hemoglobin percentage and blood-volume; Acclimatization effects on active secretion inwards of oxygen by the lungs; Factors in acclimatization to want of oxygen.

*Lecture III.*—Further analysis of oxygen secretion by the lungs; Secretion of oxygen by the swim-bladder; Secretion in other glands; Analogy between secretion and cell-nutrition; The circulatory regulation of carriage of oxygen and CO<sub>2</sub>; Regulation by vaso-motor nervous control; Evidence that this control depends upon the metabolism of the tissues; Evidence that the heart's action in pumping blood depends on the same conditions; Part played by contraction of the veins; The blood as a constant internal environment; Regulation of this internal environment by the kidneys; Regulation by other organs; Regulation after bleeding and transfusion; Regulation of the external environment; In reality the constancy of the internal or external environment is a balance between disturbing and restoring influences, each of which persists; The ordinary idea of "function" in an organ is misleading; "Causes" and "stimuli"—physiology as an endless maze of causes.

*Lecture IV.*—Examination of mechanistic interpretation of regulation of the environment; Difference between an organism and a machine; Life endures actively and develops; In life the whole is in the parts and the past is in the present; Organism, environment and life-history can not be separated; For biology life and not matter is the primary reality; The true aims and methods of biology; Biology an exact experimental science; Relation of physiological to physical and chemical investigation of organisms; The limitations of existing physical and chemical conceptions; Inadequacy of vitalism; Vitalism the inevitable accompaniment of attempted mechanistic interpretations of life; Individual life as a part of a wider life; The limitations of biological conceptions; Science and religion.

#### SCIENTIFIC NOTES AND NEWS

JOSIAH ROYCE, Alvord professor of the history of philosophy at Harvard University, dis-

tinguished for his contributions to philosophy, logic, ethics and psychology, died on September 14, in his sixtieth year.

THE British government has appointed two committees to inquire, respectively, into the position of science and modern languages in the system of education of Great Britain. The members of the committee on science are: Sir J. J. Thomson (chairman), the Rt. Hon. F. D. Acland, Professor H. B. Baker, Mr. Graham Balfour, Sir William Beardmore, Bart., Sir G. H. Cloughton, Bart., Mr. C. W. Crook, Miss E. R. Gwatkin, Sir Henry Hibbert, M.P., Mr. William Neagle, Mr. F. G. Ogilvie, C.B., Dr. Michael Sadler, C.B., Professor E. H. Starling, Mr. W. W. Vaughan, Mr. F. B. Stead, inspector of schools, secretary. This committee is instructed "to inquire into the position occupied by natural science in the educational system of Great Britain, especially in secondary schools and universities; and to advise what measures are needed to promote its study, regard being had to the requirements of a liberal education, to the advancement of pure science, and to the interests of the trades, industries and professions which particularly depend upon applied sciences."

SIR CHARLES H. BEDFORD has been appointed general secretary of the newly constituted Association of British Chemical Manufacturers. The business of the association is for the present being carried on at the offices of the Society of Chemical Industry.

DR. I. J. KLIGLER, who has been in immediate charge of the bacterial collection of the department of public health of the American Museum of Natural History, has resigned to accept a position with the Rockefeller Institute. His place will be taken by Thomas G. Hull, Ph.D. (Yale, '16).

THE Boston City Council has passed an ordinance that will give the city police court a medical department and psychologic laboratory. All offenders will pass through this department, the verdict of which as to their mental condition will be taken into consideration before sentence is pronounced. Dr. Victor V. Anderson is appointed as head.

PROFESSOR CHARLES SMITH PROSSER, head of the department of geology of the Ohio State University, has died at the age of fifty-six years. His body was found in the Olentangy River, near the university campus, on September 18. Dr. Prosser received his bachelor's, master's and doctor's degree at Cornell University and was instructor in paleontology there. Later he was paleontologist of the U. S. Geological Survey and professor at Washburn and Union Colleges, going to the Ohio State University in 1899. He was the author of important contributions to stratigraphical geology and paleontology.

WILLIAM ESSON, since 1897 Savillian professor of geometry at the University of Oxford, has died at the age of eighty-eight years.

S. B. MACLAREN, professor of mathematics in University College, Reading, died on August 14, as the result of wounds, while serving in the corps of engineers of the British army.

DR. C. C. CLOUGH, of the Scottish Geological Survey, died on August 27, aged sixty-three years.

WE learn from *Nature* that Captain A. R. Brown, formerly science master at Buckhaven High Grade School, and Second Lieutenant H. Watson, mathematical master at Ormskirk Grammar School, have both been killed in action.

DR. A. CHARPENTIER, professor of medical physics at Nancy, has died suddenly in his sixty-fifth year.

DR. WALTER ZURHELLEN, formerly an assistant director of the National Astronomical Observatory at Santiago, Chili, is, according to a wireless dispatch from Berlin, dead as a result of wounds received on the battlefield.

Two offices in the health department of the District of Columbia are created by Congress in the appropriation bill enacted September 1. A chief medical and sanitary inspector is to be appointed, who, under direction of the health officer, is to give his whole time to, and exercise direction and control of, the medical and sanitary conditions of the public schools,

at a salary of \$2,500 a year. He will assume charge of the thirteen medical inspectors and five graduate nurses now in the service. A chief food inspector, at \$1,800 a year, is authorized to have general supervision and control of the food inspection service, comprising seventeen subordinate inspectors.

In central Alaska south of the Yukon River there is a large area which prior to 1915 was practically unknown. In the summer of 1915 a small United States Geological Survey party in charge of H. M. Eakin made a rapid exploration from Tanana River at Cosna to the headwaters of Nowitna River and thence down the Nowitna to the Yukon. A preliminary statement of the important geologic and topographic observations made on that expedition has recently been published by the United States Geological Survey, Department of the Interior, as part of Bulletin 642, entitled "Exploration in the Cosna-Nowitna Region." Much time has been spent by a few prospectors in a search for placer gold on Nowitna River, but so far as is known the occurrence of commercial placers in that region has not been demonstrated. In much of the region prospecting is beset with considerable difficulty, owing to the great depth and breadth of the alluvial filling in the larger valleys. Although no lodes have yet been discovered the evidence available seems to suggest that the gold in the bedrock was probably introduced as a result of the igneous activities that produced the monzonites and granites, so that gold is most likely to be found near these intrusive masses. The map accompanying this report indicates the distribution of these intrusive rocks as well as of the other geologic formations.

DR. LUCY L. W. WILSON, excavating for the Philadelphia Commercial Museum, has closed her camp at Otowi, New Mexico. In this, her second season, she has (a) excavated 165 rooms and a kiva in the large pueblo; (b) located fourteen pueblos (two of them hundred room houses) on low ridges south of the large pueblo; (c) excavated fourteen rooms and a kiva in these smaller pueblos; (d) excavated and cleaned out the rooms in two three-story cliff dwellings in the mesa north and west of

the large pueblo; (e) explored the cave dwellings in the southern mesa and the caves in the so-called "tent villages." No certain evidence of prehistoric occupation was found in either case, in spite of reports to the contrary. Nine hundred and five artifacts were catalogued: 613 of stone, 159 of pottery, 88 of bone, 25 miscellaneous (fabric, rope, games, pendants, etc.) together with 21 burials and 53 evidences of food. Twenty-seven pieces of pottery were taken out whole, including five *tinajas*. The most important single find was that of an anthropomorphic figure of clay, originally colored red, with turquoise eyes and a turquoise in the chest. The work of excavation will be continued for at least another season.

ACCORDING to the London correspondent of the *Journal* of the American Medical Association the births registered in England in the fourth quarter of 1915 corresponds to a rate of 19.5 annually per thousand of the population. This rate is 4.6 per thousand below the mean birth rate in the ten preceding fourth quarters and 2.7 below the rate in the corresponding period of 1914; it is the lowest birth rate recorded in any quarter since the establishment of civil registration. The natural increase of population in England and Wales last quarter by excess of births over deaths was 46,368, against 87,995, 89,045 and 77,394 in the fourth quarters of 1912, 1913 and 1914, respectively. The deaths registered in the same quarter correspond to an annual rate of 14.6 per thousand persons living; this rate is 0.3 per thousand above the mean rate in the ten preceding fourth quarters, and 0.7 per thousand above the rate in the fourth quarter of 1914. During the year 1915 there were 814,527 births and 562,326 deaths registered in England and Wales. The natural increase of population, by excess of births over deaths, was, therefore, 252,201, the average annual increase in the preceding five years having been 378,360. The number of persons married during the year was 720,052. The marriage rate was 19.3 persons married per thousand of the population, which is 3.5 per thousand above the rate in 1914 and higher than the rate in any other year on record. One of the phe-

nomena of the present time is the war wedding. The greater part of the young men of the country have joined the army and often marry before leaving for the front. The reason generally appears to be financial. If they join the ranks their wives are entitled to separation allowances, and if they are killed, to pensions. In the better classes, from which the officers usually come, the desire that their fiancées shall succeed to their property is another motive. Compared with the average in the ten years 1905-1914, the marriage rate in 1915 showed an increase of 3.9 per thousand. The birth rate was 21.8 per thousand of the population, which is 1.8 per thousand below the rate in 1914, and lower than the rate in any other year on record. Compared with the average in the ten years 1905-1914, the birth rate in 1915 showed a decrease of 3.6 per thousand. The death rate in 1915 was 15.1 per thousand, which was 1.2 per thousand above the rate in 1914. Compared with the rate in the ten years 1905-1914, the death rate in 1915 showed an increase of 0.7 per thousand.

WE learn from *Nature* that at the annual general meeting of the Chemical Society held at Burlington House, Dr. Alexander Scott presided, and a discussion took place with regard to the removal from the list of those honorary and foreign members who are alien enemies, and it was decided to refer the matter to the council for further consideration. It was with great pleasure the president announced that the following donations had been made to the research fund: (a) £1,000 from Dr. G. B. Longstaff, whose father, by his gift of a similar amount, was largely instrumental in founding the research fund forty years ago; (b) £1,000 from Mrs. and Miss Müller, in commemoration of the late Dr. Hugo Müller's long connection with the society; (c) £500 from Dr. Alexander Scott, to mark his appreciation of the valuable work done by the research fund, and in commemoration of the seventy-fifth anniversary of the society. Professor G. G. Henderson and Professor A. Lapworth were elected new vice-presidents, and Mr. A. Chaston Chapman, Mr. C. A. Hill, Dr. R. H. Pick-

ard, and Dr. F. L. Pyman were elected as new ordinary members of council.

THE Chemists' Club of New York announces the establishment of another scholarship fund, the income from which, approximately \$400 per year, is to be devoted to assisting financially deserving young men to obtain education in the field of industrial chemistry or chemical engineering. This scholarship has been endowed by Mr. Wm. F. Hoffmann. Its benefits will be open to properly qualified applicants without restriction as to residence, and may be effective at any institution in the United States which may be designated or approved by the Chemists' Club. In accordance with the deed of trust applicants must, as a minimum qualification, have completed a satisfactory high-school training involving substantial work in elementary chemistry, physics and mathematics and present a certificate showing that they have passed the entrance examination requirements of the College Entrance Examination Board or its equivalent. Preference will be given to young men who have supplemented these minimum qualifications with additional academic work, especially in subjects which will form a suitable foundation for the more advanced study of applied chemistry and chemical engineering. All inquiries should be addressed to the Hoffmann Scholarship Committee of the Chemists' Club, 50 East 41st Street, New York City. Applications for the next academic year should be in the hands of the committee on or before June 1, 1917. The scholarship will be awarded and candidates selected and notified on or before July 1.

IN his anniversary address to the Society of Antiquaries, the president, Sir Arthur Evans, made the following observations:

I am well aware that the question of the expulsion, or at least suspension, of German honorary members of this and other learned societies in this country is in the air. There seems, at the same time, to be a general consensus of opinion that if any action in this matter be considered desirable it should be taken in common. To this end your council have empowered me to submit proposals on their behalf. But I will not attempt to conceal

from the society my own feelings on this grave matter. . . . The existence among German honorary fellows of savants belonging to that noble class of which the late Dr. Helbig stood forth as a conspicuous example—to whom the brotherhood of science was a bond at least as great as that of nationality and language—should give us pause before we carry out any too sweeping measures. In spite of the "Gospel of Hate," let it be said to their credit, the learned societies and academies of Germany, with inconsiderable exceptions, have refrained from striking their English members from their rolls. In spite of official pressure, the Academy of Berlin has twice refused to take this action. I myself am not ashamed of confessing that I have received, in the period of the war itself, cordial and even unsolicited assistance from a German archeologist, occupying a high official position. . . . In these times of intolerable provocation we, and members of kindred societies, who stand on the neutral ground of science have a high duty to perform. That there should be a serious and prolonged estrangement of the peoples of the British commonwealth from those of the German empire has become inevitable. But this does not affect the immutable condition of all branches of research, which is their essential interdependence. We have not ceased to share a common task with those who to-day are our enemies. We can not shirk the fact that to-morrow we shall be once more laborers together in the same historic field. It is incumbent on us to do nothing which should shut the door to mutual intercourse in subjects like our own, which lie apart from the domain of human passions, in the silent avenues of the past.

We learn from the *British Medical Journal* that the museum of the French army medical service installed at the Val-de-Grâce military hospital under the direction of Professor Jacob, was recently formally opened by M. Justin Godard, under secretary of state of the sanitary service. On the ground floor are a library, an archives room, and others for specimens, mouldings and apparatus. The first floor is given up to a collection of the instruments of destruction—bullets, shells (incendiary, shrapnel, asphyxiating and explosive gases), aerial torpedoes, Zeppelin and aeroplane bombs—used by the Germans; alongside these are specimens of protective apparatus (helmets and masks). Then comes a miniature exposition of sanitary cantonments, special

beds, and other hygienic inventions for use at the front. A laboratory of antityphoid vaccination displays the apparatus, the preparations used, and the graphic records. Painted sculptures by M. Jean Larrivé illustrate the working of the sanitary service. A series of reliefs shows first aid in the trenches, the transport of a badly wounded man, the arrival at the first line dressing station, and the interior of the station. A room is set apart for surgical instruments and sterilizing apparatus, with models showing the disinfection of wounds by the Dakin method.

A VALUABLE collection of foreign and domestic woods in panel form is being installed on the second and third floors of the rotunda in the new \$250,000 Forestry Building of the State College of Forestry at Syracuse. For the past two years search has been made throughout the country for available commercial varieties of wood native to this country, as well as the important commercial woods from South America, Mexico, the West Indies, Africa and the East Indies. Among the rare foreign woods that will be displayed as panels around the rotunda in the College of Forestry building are African gaboon, East India koa, marblewood, East India rosewood, satinwood, camphor wood, teak, Circassian walnut and eight different kinds of mahogany. Among the western woods of this country displayed are Douglas fir, California redwood, sugar pine, western yellow pine, Sitka spruce, Port Oxford cedar, incense cedar and several varieties of eucalyptus. The southern forests are represented by cypress, southern hard pine, North Carolina pine, red and black gum, cucumber and persimmon. A great variety of native hard and soft woods found in New York are the nucleus around which these rarer woods are gathered. The collection of panels of native and foreign woods built into the rotunda of the College of Forestry building at Syracuse are being finished carefully to bring out the natural grain to best effect and at the same time to detract as little as possible from the native color and natural wood fibers. Each panel is to be labeled with the common and scientific name so that both the

student body of the college and the many visitors who come to the building may study a permanent exhibit of unusual interest and value. Lumber manufacturers' associations and lumbermen throughout the country have been cooperating very cordially with the New York State College of Forestry in supplying these panels.

A MACHINE for testing the strength of boxes has been devised by engineers of the Forest Service and is in use at the Forest Products Laboratory at Madison, Wisconsin. The machine is the result of experiments made to determine a fair test for all types of boxes. A series of tests in cooperation with the American Society for Testing Materials and the National Association of Box Manufacturers has been carried on during the past year to determine the strength of boxes of various woods and of different construction. Over four and a half billion feet of lumber is used for box making every year, and on this account the tests are considered important. Moreover, big losses are caused by the breakage of boxes in transit, and all parties concerned are said to be anxious to determine the best kind of box. The machine consists of a hexagonal drum with  $3\frac{1}{2}$ -foot sides, which is lined with thin steel sheets. Pieces of scantling bolted to the bottom form what are known as "hazards." In making the tests boxes filled with cans containing water are placed in the drum, which is then rotated. For convenience in observing the results of the tests, the sides and ends of the box are numbered with large figures, and in addition other numbers are placed at specified points on each side. The "hazards" cause the boxes to be carried part way round and then dropped back to the lower level of the drum. Each fall of this sort is a pretty fair imitation of the probable treatment it would receive in shipment. The boxes are watched carefully, and notes are taken on the manner in which they give way and the number of falls required to break them in pieces. In this way it is possible to determine what kinds of woods are best suited for boxes. The tests showed a decided need for a standard classification of box woods, and three

groups have been made, based on the data that were obtained.

LEADING metal-producing companies from all sections of the country will be represented by members of their staff at the meeting of the American Institute of Mining Engineers, which convenes in Arizona on September 18. The country's record production of metal during the past year has greatly stimulated the interest in those general mining topics which will be discussed at the institute's sessions. More than twenty corporations have already expressed a desire to be represented by institute members who may participate in the technical gathering. Some of these are Anaconda Copper Mining Co., the largest copper producing company in the country; American Smelting and Refining Co., the largest lead-producing company; Ray Consolidated Copper Co., Treadwell and Alaska Juneau mines, Miami Copper Co., and the New Jersey Zinc Co. Among the engineers who will be present are L. D. Ricketts, Benjamin B. Thayer, William L. Saunders, Sidney J. Jennings, George D. Barron and Philip N. Moore. A special train from New York will be the traveling headquarters, the train moving from point to point in Arizona each day during the week of the convention. Some seventy papers have been prepared for discussion at the meeting. These papers bear largely upon new methods of production and the mining outlook in various parts of the world.

#### UNIVERSITY AND EDUCATIONAL NEWS

UNDER the will of William Watson Lawrence, of Pittsburgh, Princeton University will ultimately receive the residue of his estate, estimated at more than \$750,000.

PROFESSOR CARL T. DOWELL, instructor of chemistry at the University of Texas, Austin, has been elected associate professor of chemistry at Tulane University.

THE following appointments and changes are announced from the University of Illinois:

Professor Richard C. Tolman, recently at the University of California, has been appointed professor of physical chemistry to succeed Professor E. W. Washburn, who has been appointed head of the department of ceramics. Dr. Roger C. Adams has been appointed assistant professor of organic chemistry to succeed Dr. C. G. Derick, who is organizing a research laboratory for the Schoellkopf Aniline and Chemical Works in Buffalo. Dr. Horace G. Deming, recently returned from the Philippines, has been appointed associate in chemistry to assist in the instruction in general chemistry and qualitative analysis. Professor C. W. Balke, formerly at the head of the division of general chemistry and qualitative analysis is organizing a research laboratory for the Pfanstiehl Company in North Chicago which is engaged in the application of rare metals to industrial uses.

#### DISCUSSION AND CORRESPONDENCE VITALISM

I HAVE read with much interest the addresses that have appeared in *SCIENCE*, forming part of a symposium on "The Basis of Individuality in Organisms." But I have not noted that two well-known facts, that seem to me of major importance to the discussion, have been jointly focused on the problem. May I mention them, and briefly suggest their bearing?

1. I assume all would agree that non-perceptual realities—Spencer's Unknowable, Kant's Ding-an-sich, Locke's Something, I know not what, that supports sensations—exist, and are the kernel of *all* matter, dead and living. These realities—whose natures remain so dim to our inquiries—it is that *behave* in the ways laboriously and skilfully discovered, described and formulated by natural science. Their existence and basal activity might, further, be thought to validate vitalism. For the active beings (*i. e.*, themselves) of which conscious organisms are aware are the very realities that behave after the conscious fashion, and their natures might reasonably be thought to throw light on their behavior, as has, in fact, been